INSTRUCTION MANUAL

REGULATED POWER SUPPLIES

LGS-6 SERIES

MP MASTER
MA28620

LAMBDA

LAMBDA ELECTRONICS MELVILLE, L. I., N. Y.

INSTRUCTION MANUAL

FOR

REGULATED POWER SUPPLIES

LGS-6 SERIES

This manual provides instructions intended for the operation of Lambda power supplies, and is not to be reproduced without the written consent of Lambda Electronics. All information contained herein applies to all LGS-6 models unless otherwise specified.

LAMBDA ELECTRONICS MELVILLE, L.I., N.Y.

MAIN PLANT TELEPHONE: 516 MYrtle 4-4200

IM-LGS-6

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SPECIFICATIONS AND FEATURES

DC OUTPUT — Voltage regulated for line and load. See table I for voltage and current ratings.

TABLE I
VOLTAGE AND CURRENT RANGES

MODELS	VOLTAGE RANGE	MAXIMUM CURRENT (AMPS) AT AMBIENT TEMPERATURE			
		40°C	50°C	60°C	71°C
LGS-6-5-OV-R	5 ± 5%	70.0	61.0	51.0	38.0
LGS-6-6-OV-R	6 ± 5%	60.0	56.0	49.0	36.0
LGS-6-12-OV-R	12 ± 5%	37.5	35.0	30.5	23.0
LGS-6-15-OV-R	15 ± 5%	30.0	28.0	24.5	20.5
LGS-6-20-OV-R	20 ± 5%	23.0	21.5	18.5	15.5
LGS-6-24-OV-R	24 ± 5%	20.0	19.0	16.0	13.0
LGS-6-28-OV-R	28 ± 5%	17.5	16.5	14.5	12.0

Current range must be chosen to suit the appropriate maximum ambient temperature. Current ratings apply for entire voltage range.

REGULATED VOLTAGE OUTPUT

Regulation ..... 0.1% line or load with input variations from 105-132 or 132-105 volts AC and load variations from no load to full load.

Ripple and Noise ..... 10mV RMS, 35mV peak-to-peak for LGS-6-5-OV-R, -6-OV-R models; 15mV RMS, 100mV peak-to-peak for LGS-6-12-OV-R, -15-OV-R, -20-OV-R, -24-OV-R, and -28-OV-R with either positive or negative terminal grounded.

Temperature Coefficient ..... Change in output voltage 0.03%/°C max.

Remote Programming

External Resistor ..... Nominal 1000 ohms/volt output.

Programming Voltage ..... One-to-one voltage change.

Remote Sensing ..... Provision is made for remote sensing to eliminate effect of power output lead resistance on DC regulation.

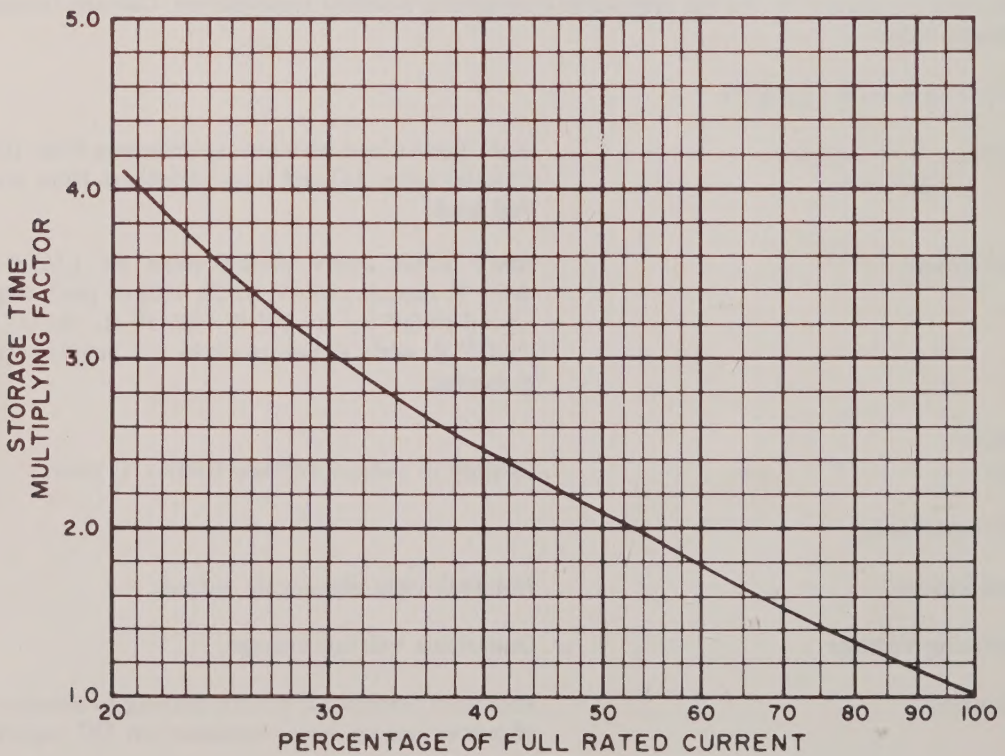
STORAGE TIME — Determine storage time regulation after input power failure as follows:

1. Find storage time at full rated current from chart below.
2. Determine percentage of full rated current for desired application.
3. Find multiplying factor on graph below.
4. Apply storage time formula:

$$S = (F)\,(M)$$

where S = storage time
F = storage time at full rated current (see chart)
M = multiplying factor (see graph)

MODEL	STORAGE TIME (ms) AT FULL RATED CURRENT
LGS-6-5-OV-R	18.0
LGS-6-6-OV-R	17.5
LGS-6-12-OV-R	3.0
LGS-6-15-OV-R	4.5
LGS-6-20-OV-R	6.0
LGS-6-24-OV-R	2.0
LGS-6-28-OV-R	1.0



OVERSHOOT — No overshoot under conditions of power turn-on, turn-off, or power failure.

INPUT

AC Input ..... 105-132 VAC at 47-440 Hz. Input power: 750 Watts*. Input Current: 10.0 Amps**. For operation at frequencies above 440 Hz, consult factory.

*With output loaded to full current rating.
**With output loaded to full current rating and input voltage 105 VAC, 60 Hz.

DC Input ..... 145 VDC ±10%. Input power: 750 Watts†. Input current: 5.8 Amps††.

†With output loaded to full current rating.
††With output loaded to full current rating and input voltage 130 VDC.

INPUT FUSE — Fuse F1 protects the input wiring to the power supply. Overload of power supply does not cause fuse failure.

OVERLOAD PROTECTION

Thermal ..... Thermostat resets automatically when over-temperature condition is eliminated.

Electrical ..... Automatic electronic current limiting circuit, limits output current to a preset safe value. Automatic current limiting protects the load and power supply when external overloads and direct shorts occur.

OVERVOLTAGE PROTECTION — All LGS-6 models include fixed built-in overvoltage protection circuits which prevent damage to the load caused by excessive power supply output voltage. See table below for overvoltage protector firing ranges.

MODEL	OVERVOLTAGE PROTECTOR TRIP-POINT RANGE (VOLTS)
LGS-6-5-OV-R	6.3 — 6.9
LGS-6-6-OV-R	7.1 — 7.7
LGS-6-12-OV-R	13.3 — 14.1
LGS-6-15-OV-R	16.5 — 17.5
LGS-6-20-OV-R	22.1 — 23.5
LGS-6-24-OV-R	26.5 — 28.1
LGS-6-28-OV-R	30.9 — 32.9

INPUT CONNECTIONS — Terminal block on front of chassis.

OUTPUT CONNECTIONS — 1/4 - 28 studs on front of chassis.

OPERATING AMBIENT TEMPERATURE RANGE AND DUTY CYCLE — Continuous duty from 0°C to 71°C ambient with corresponding load current ratings for all modes of operation.

STORAGE TEMPERATURE (non operating) — -55°C to 85°C

FUNGUS — All LGS-6 power supplies are fungus inert.

VDC ADJ. Control — Voltage adjust control permits adjustment of DC output over entire operating range.

PHYSICAL DATA

Size	3-3/16" x 7-1/2" x 15-1/8"
Weight	20.0 lbs. net; 23.0 lbs. shipping
Finish	Gray, FED. STD. 595 No. 26081

MOUNTING — One surface, with tapped mounting holes can be utilized for mounting this unit. LGS-6 power supplies must be mounted with Top facing up and in a horizontal plane. Refer to figure 10 for mounting details.

ACCESSORIES

Rack adapters	Rack adapters LRA-7, LRA-8, and LRA-11, used for ruggedized mounting with or without chassis slides, are available.

THEORY OF OPERATION

GENERAL

The Lambda power supply consists of an input circuit; an auxiliary rectifier and filter; a main output rectifier; and a main regulator circuit consisting of timing oscillator, flip-flop, comparator, nor gates, control and current limit amplifiers, and pulse width modulated inverter.

The circuit arrangement is shown in block diagram form in figure 8. The circuitry is discussed with reference to the block diagram and the schematic diagram.

FUNCTIONAL DESCRIPTION

Input Circuit

Single phase AC input power is applied to bridge circuit CR7, CR8, SCR5, SCR6 via EMI suppression network C20, C21, C18, C22, C16, C15, C17, L3, L4. Fuse F1 protects the power supply against excessive currents due to internal failure.

The input rectifier and filter capacitors C1, C2 provide power via R1, C104, and CR129 for the logic circuitry and provide power to the pulse width modulated inverter.

On initial turn-on, capacitors C1, C2 are charged via CR103, R15, R16. Capacitor C107 is charged via R113. When the voltage on C107 exceeds the reference voltage of control amplifier HC101, HC101 turns on which, in turn, turns on the pulse width modulated inverter. The pulse width modulated inverter supplies gate voltage to SCR5 and SCR6 via CR5 and CR6. This action serves to prevent excessive in-rush current when unit is turned on.

Pulse Width Modulated Inverter

Positive and negative pulses are provided to the primary of T1 by the alternate conduction of Q1 and Q2. The duration of these pulses is determined by the conduction time of Q1 and Q2. This time is determined by the duration of drive pulses applied to the bases of Q101 and Q102 by IC103.

When Q101 is turned on, voltage will be applied to the base of Q1 via C125, CR105, CR108, and CR110 turning Q1 on. As current through C125 decays, regenerative action holds Q1 on by providing base drive to Q1 via CR11, CR10, CR9, R10, feedback winding of T1, CR114, and CR115. Diode CR118 prevents saturation of Q1 which would extend turn-off time. Resistor R101 provides sufficient current to keep Q103 and Q105 off.

When Q101 is turned off, C105 provides voltage to turn on Q103 which, in turn, turns on Q105. C106 then supplies negative bias to base of Q1 via Q105. This action rapidly turns off Q1 and holds it off.

A similar sequence of events serves to turn Q2 on and off as Q102 is turned on and off.

Output Circuit

Positive and negative pulses supplied by T1 secondary are rectified by full wave rectifiers CR1, CR2; filtered by filter network C3, L1; and supplied to the output via E.M.I. suppression network C8, C9, C13, C14, L2, L9, L10, L11, L12.

Logic and Control Circuits

IC101 is a free running timing oscillator. The output, pin 3, of IC101 is high for 23 microseconds and low for 5 microseconds resulting in an overall period of 28 microseconds. The output of IC101 is fed into flip-flop IC102. IC102 is triggered by the leading edge of the IC101 output resulting in square waves having periods of 56 microseconds at the Q and $\overline{Q}$ (pins 1 and 2) outputs of IC102. Each square wave serves as one input to one of two nor gates located within IC103. The other input of each gate is provided by internal circuitry within IC103 connected as an amplitude comparator at pin 1 of IC103. Pin 1 of IC103 is controlled by the output of the hybrid control amplifier HC101.

HC101 control output is determined by changes in output voltage as sensed via L7, voltage control R19, and resistor R119. If the output voltage tends to decrease, current from pin 6 output of HC101 is delayed thereby delaying the charging of C119 and delaying the high input to pin 1 of IC103. This action delays the turning off of the drive output to Q101 or, as applicable Q102. When IC101 pin 3 goes low, the voltage at IC103 pin 1 is reset via CR126. The connection from IC101 pin 3 to IC103 pins 5 and 6 via CR127 serves to prevent Q101 and Q102 from being turned on while the timing oscillator is in the low state. This sequence is shown in the following truth table:

IC101	IC102		IC103			
TIMING OSCILLATOR	FLIP-FLOP OUTPUTS		INPUT	DRIVE OUTPUTS		REMARKS
Pin 3	Pin 1	Pin 2	Pin 1	Pin 10	Pin 11	
low	low	high	low	low	low	inverter dead period
high	low	high	low	high	low	drive Q101
high	low	high	high	low	low	inverter quiescent period
low	high	low	low	low	low	inverter dead period
high	high	low	low	low	high	drive Q102
high	high	low	high	low	low	inverter quiescent period
low	low	high	low	low	low	inverter dead period

Current Limit Operation

As the load current tends to increase, the inverter current increases, thereby increasing the voltage across R5. This voltage is sensed by hybrid control amplifier HC101. The result is the progressive hastening of the current output from HC101 pin 6 and therefore, drive current to Q101 or, as applicable, Q102 is turned off sooner and sooner until the conduction time of the inverter becomes less than 3 microseconds.

*As HC101 goes into current limit mode, it begins to draw current at pin 8 via resistors R121 and R122, turning on Q107. This, in turn, turns on Q108. This effectively places C112 in parallel with C118 decreasing the frequency of timing oscillator IC101. This action serves to further limit the output current.

*Applicable only to models LGS-6-20-OV-R through LGS-6-28-OV-R.

As load impedance approaches a short circuit the load current is held relatively constant.

Overvoltage Circuit Operation

When the output voltage reaches the trip-point of the hybrid overvoltage module, the module fires crow-barring the output of the supply. The current through the module is sensed by current sensor L8. The output of L8 triggers SCR101, crow-barring the logic circuitry and turning the inverter off.

OPERATING INSTRUCTIONS

BASIC MODE OF OPERATION

This power supply operates as a constant voltage source provided the load current does not exceed the rated value at 40°C. For continuous operation, load current must not exceed the rating for each ambient temperature. When rated load current is exceeded, voltage decreases towards zero and the current at short circuit is held to a safe value.

CONNECTIONS FOR OPERATION

NOTE: Make all connections to the unit before applying input power.

Ground Connections. The Lambda power supply can be operated either with negative or positive output terminal grounded. Both positive and negative ground connections are shown in the diagrams for all suggested output connections illustrated in this manual.

Connection Terminals. Make all connections to the supply at the terminal block and power studs on the front of the supply. Apply input power to terminals 1 and 2; always connect the ungrounded (hot) AC or positive DC lead to terminal 1.

The supply positive terminal is brought out to terminal 6. The supply negative terminal is brought out to terminal 4. Recommended wiring of the power supply to the load and selection of wiring is shown in figures 1 through 9. Selection of proper wiring is made on the basis of load requirements. Make all performance checks and measurements of current or voltage at the front output terminals. Connect measuring devices directly to terminals or use the shortest leads possible.

SUPPLY LOAD CONNECTIONS

Connections for Operation as a Constant Voltage Source

The output impedance and regulation of the power supply at the load may change when using the supply as a constant voltage source and connecting leads of practical length are used. To minimize the effect of the output leads on these characteristics, remote sensing is used. Recommended types of supply-load connections with local or remote sensing are described in the following paragraphs.

Refer to figure 1 to determine voltage drop for particular cable length, wire size and current conditions. Lead lengths must be measured from supply terminals to load terminals as shown in figure 2.

Local Sensing Connection, Figure 3. Local sensing is the connection suitable for applications with relatively constant load or for applications with short power output leads.

Remote Sensing Connection, Figure 4. Remote sensing provides complete compensation for the DC voltage drops in the connecting cables. Sensing leads should be a twisted pair to minimize AC pick-up. A 2.5 mf elect., capacitor may be required between output terminals and sense terminals to reduce noise pick-up.

Programmed Voltage Connections, Using External Resistor, Figure 5. Discrete voltage steps can be programmed with a resistance voltage divider valued at a nominal 1000 ohms/volt change and a shorting-type switch as shown in figure 5. When continuous voltage variations are required, use a variable resistor with the same 1000 ohms/volt ratio in place of the resistive voltage divider and shorting-type switch. Use a low temperature coefficient resistor to assure most stable operation.

Before programming, adjust programming resistor for zero resistance and set voltage adjust control to the minimum rated output voltage. Output voltage of programmed supply will nominally be minimum output voltage plus 1 volt per 1000 ohms.

As shown in figure 5, voltages can be programmed utilizing either local or remote sensing connections, as desired.

Programmed Voltage Connections Using Programming Voltage, Figure 6. The power supply voltage output can be programmed with an externally connected programming power supply. The output voltage change of the programmed supply will maintain a one-to-one ratio with the voltage of the programming supply. If the output voltage control of the programmed supply is set to minimum output voltage, output voltage of the programmed supply will be minimum output voltage plus voltage of programming supply.

The programming supply must have a reverse current capability of 1 ma. minimum.

Alternatively, when supplies with less than 1 ma. reverse current capability are used, a resistor capable of drawing 1 ma. at the minimum programming voltage must be connected across the output terminals of the programming supply. This programming supply must be rated to handle all excess resistor current at the maximum programming voltage.

Connections For Series Operation, Figure 7.

The voltage capability of LGS-6 power supplies can be extended by series operation. Figure 7 shows the connections for either local or remote sensing in a series connection where the voltage control of each unit functions independently to control the output.

A diode, having a current carrying capability equal to or greater than the maximum current rating of the supply, must be used and connected as shown in figure 7. The diode blocking voltage should be at least twice the maximum rated output voltage of the supply. See table I, of SPECIFICATIONS AND FEATURES, for power supply current and voltage ratings.

OPERATION AFTER PROTECTIVE DEVICE SHUTDOWN

Thermostat Shutdown. The thermostat shuts down inverter operation only when the temperature of the main rectifier heat radiator exceeds a maximum safe value. The thermostat will automatically reset when the temperature of the heat sink decreases to a safe operating value.

Fuse Shutdown. Fuse will blow when the maximum rated current value for the fuse is exceeded. Fatigue failure of fuses can occur when mechanical vibrations from the installation combine with thermally induced stresses to weaken the fuse metal. Many fuse failures are caused by a temporary condition and replacing the blown fuse will make the fuse protected circuit operative.

Overvoltage Shutdown. When the power supply output voltage increases above the overvoltage limit, HC1 will short circuit output of the supply and SCR101 will shut down inverter operation. After eliminating the cause(s) for overvoltage, resume operation of the supply by interrupting the AC input circuit for a period of twenty seconds. (refer to TROUBLE SHOOTING CHART)

MAINTENANCE

GENERAL

This section describes trouble analysis routine, calibration and test procedures that are useful for servicing the Lambda power supply. A trouble chart is provided as an aid for the troubleshooter. Refer to the section on SPECIFICATIONS AND FEATURES for the minimum performance standards.

OPENING UNIT FOR TROUBLE SHOOTING AND REPAIR

Whenever it is necessary to trouble shoot and repair the Lambda LGS-6 power supply, open the unit as follows:

1. Remove top cover by removing 12 screws along edge of cover.

2. Remove wrap-around bottom cover along with attached components by removing 13 screws along edge of cover.

3. Power supply components are now accessible for trouble shooting and repair.

TROUBLE ANALYSIS

Whenever trouble occurs, systematically check all fuses, primary power lines, external circuit elements, and external wiring for malfunction before troubleshooting the equipment. Failures and malfunctions often can be traced to simple causes such as improper jumpers and supply-load connections or fuse failure due to metal fatigue.

Use the electrical schematic diagram and block diagram, figure 8, as an aid to locating trouble causes. The schematic diagram contains various circuit voltages that are averages for normal no load operation. Measure these voltages using the conditions for measurement specified on the schematic diagram. Use measuring probes carefully to avoid causing short circuits and damaging circuit components.

CHECKING TRANSISTORS AND CAPACITORS

Check transistors with an in-circuit transistor checker. If no checker is available, transistors can be checked with an ohmmeter that has a highly limited current capability. Observe proper polarity for PNP or NPN to avoid error in measurement. The forward transistor resistance is low but never ZERO; backward resistance is always higher than the forward resistance.

Do not assume trouble is eliminated when only one part is replaced. This is especially true when one transistor fails, causing other transistors to fail. Replacing only one transistor and turning power on, before checking for additional faulty components could damage the replaced component.

When soldering semi-conductor devices, hold the lead being soldered with a pair of pliers or a commercial heat sink device placed between the component and the solder joint.

NOTE: The leakage resistance obtained from a simple resistance check of a capacitor is not always an indication of a faulty capacitor. In all cases the capacitors are shunted with resistances, some of which have low values. Only a dead short is a true indication of a shorted capacitor.

PRINTED CIRCUIT BOARD MAINTENANCE TECHNIQUES

1. If foil is intact, but not covered with solder, it is a good contact. Do not attempt to cover with solder.
2. Voltage measurements can be made from either side of the board. Use a needle-point probe to penetrate to the wiring whenever a protective coating is used on the wiring. A brass probe can be soldered to an alligator clip adapted to measuring instrument.
3. Always use a heat sink when soldering transistors; a transistor pad with mounting feet is an effective heat sink.

4. Broken or damaged printed wiring is usually the result of an imperfection, strain or careless soldering. To repair small breaks, tin a short piece of hook-up wire to bridge the break, and holding the wire in place, flow solder along the length of wire so that it becomes part of the circuitry.
5. When unsoldering components from the board never pry or force loose the part; unsolder the component by using the wicking process described below:
   a) Select a 3/16 inch tinned copper braid for use as a wick; if braid is not available, select AWG No. 14 or No. 16 stranded wire with 1/2 inch insulation removed.
   b) Dip the wick in liquid rosin flux.
   c) Place the wick onto the soldered connection and apply soldering iron onto the wick.
   d) When sufficient amount of solder flows onto the wick, freeing the component, simultaneously remove iron and wick.

TROUBLE CHART

The trouble chart is intended as a guide for locating trouble causes and is used along with the schematic diagram.

The operating conditions assumed for the trouble chart are as follows:

a) AC power of proper voltage and frequency is present at input terminals.

b) Either positive or negative terminal is connected to chassis ground.

c) The power supply is connected for constant voltage with local sensing. See schematic; dotted lines indicate jumpers connected for local sensing operation.

SAFETY NOTICE

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT. OBSERVE THE USUAL SAFETY PRECAUTIONS WHEN OPERATING OR SERVICING THE EQUIPMENT TO AVOID SHOCK OR INJURY.

TROUBLE SHOOTING CHART

Symptom	Possible Cause	Remedy
1. Zero volts DC output, voltage across C1, C2 reads zero.	Open F1, CR7, CR8, CR103, R15, SCR5, SCR6	Check and replace as necessary.

TROUBLE SHOOTING CHART

Symptom	Possible Cause	Remedy
2. Same as 1, voltage across C1, C2 is correct, voltage across C104 is zero.	Thermostat S1 closed.	Refer to table 1 of SPECIFICATIONS AND FEATURES for current ratings at given ambient temperature. After allowing time for the power supply to cool, resume operation of the supply.
	SCR101 fired due to OV condition	Interrupt AC input for twenty seconds. If supply operates normally, a transient has occurred in line or load, check wiring (switches, etc.). If supply fails to reach full output voltage, remove AC input, disconnect +V terminal of HC1, remove load, apply AC power and refer to procedure for: Output Too High "Symptom 4."
	R1 open, CR129 shorted.	Check and replace as necessary.
3. Same as 1, voltage across C1, C2 and C104 are correct.	Q1, Q2, R5 open.	Check and replace as necessary.
4. Output voltage too high.	Open sense lead.	Check load and load connections, correct as necessary.
	Defective HC101. Open R119, R19, R130, CR122 — CR125	Check and replace as necessary.
5. Very low output voltage, voltage across C104 reads correct	R126, R127 open. HC101, SCR101 defective	Check and replace as necessary
6. High ripple	Defective HC101	Replace as required.

PERFORMANCE CHECKS

Check the ripple and regulation of the power supply using the test connection diagram shown in figure 9. Use suggested test equipment or equivalent to obtain accurate results. Refer to SPECIFICATIONS AND FEATURES for minimum performance standards.

Set the differential meter, DC DVM (John Fluke Model 891A or equivalent) to the selected power supply operating voltage. Check the power supply load regulation accuracy while switching from the no load to load condition. Long load leads should be a twisted pair to minimize AC pick-up.

Use a Variac to vary the line voltage from 105-132 or 132-105 volts AC and check the power supply line regulation accuracy on the DVM differential meter.

Use a TVM, John Fluke Model 931B or equivalent, to measure rms ripple voltage of the power supply DC output. Use oscilloscope to measure peak-to-peak ripple voltage of the power supply DC output.

ADJUSTMENT OF CALIBRATION CONTROL R125.

Whenever HC101, R5, or R125 are replaced, and voltage and current indications do not reflect maximum ratings, adjust R125 as follows. The adjustment procedure requires that the power supply is removed from associated equipment, is at an ambient temperature of 25-30°C, and is stabilized and not operating.

1. Remove AC input power to the supply.
2. Break seal on wiper of R125 from resistor housing and turn to full CW position.
3. Operate power supply for constant voltage with local sensing connected as shown in figure 3, with no external load, and with AC input of 132 VAC, 60 Hz.
4. Turn voltage adjust control until minimum rated output voltage is obtained.
5. Apply load so that output current is 105% of 40°C rating for the unit.

6.* Using an oscilloscope, Tektronix 503 or equivalent, observe output voltage while adjusting R125 in CCW direction. Adjust R125 until output ripple increases sharply and the unit emits an audible noise. Readjust R125 in CW direction until output ripple is restored to its original value.

7.* After adjustment is completed, remove AC power input to the supply and use glyptol sealant to seal wiper of R125 to resistor housing.

8.* After sealing, check setting and repeat adjustment procedure if required.

* Perform alternate steps 6A through 8A for adjustment of R125 on models LGS-6-5-OV-R and LGS-6-6-OV-R.

6A. Using an oscilloscope, Tektronix 503 or equivalent, observe output voltage while adjusting R125 in CCW direction. Adjust R125 until output ripple increases sharply and oscilloscope pattern changes.

7A. After adjustment is completed, remove AC power input to the supply and use glyptol sealant to seal wiper of R125 to resistor housing.

8A. After sealing, check setting and repeat adjustment procedure if required.

SERVICE

When additional instructions are required or repair service is desired, contact the nearest Lambda office where trained personnel and complete facilities are ready to assist you.

Please include the power supply model and serial number together with complete details of the problem. On receipt of this information, Lambda will supply service data or advise shipping for factory repair service.

All repairs not covered by the warranty will be billed at cost and an estimate forwarded for approval before work is started.

PARTS ORDERING

Standard components and special components used in the Lambda power supply can be obtained from the factory. In case of emergency, critical spare parts are available through any Lambda office.

The following information must be included when ordering parts:

1. Model number and serial number of power supply and purchase date.
2. Lambda part number.
3. Description of part together with circuit designation.
4. If part is not electronic part, or is not listed, provide a description, function, and location, of the part.

PARTS LIST

The electrical parts located on Lambda models LGS-6-5-OV-R — LGS-6-28-OV-R are listed here. Parts common to a group of models are listed first. Unique parts of individual models within the group are listed separately, by model, immediately following the group common parts listing.

COMMON PARTS
MODELS LGS-6-5-OV-R — LGS-6-28-OV-R

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
C1, C2	Cap., elect., 2,000 mf -10 +100%, 200 vdc	CBS-20-130
C6	Cap., polypropylene, 0.47 mf ±20%, 200 vdc	CKM-47-001
C7	Cap., mica, 0.0015 mf ±5%, 500 vdc	CCK-15-004
C8	Cap., ceramic, 0.1 mf ±20%, 500 vdc	CDM-10-002
C9	Cap., mylar, 0.47 mf ±10%, 300 vdc	CGM-47-028
C10, C11	Cap., ceramic, 0.02 mf ±20%, 1,400 vdc	CDL-20-003
C12	Cap., elect., 10 mf -10 +50%, 50 vdc	CBP-10-078
C13	Same as C8	
C14	Same as C9	
C15	Cap., ceramic, 0.01 mf -20 +80%, 3,000 vdc	CDL-10-014
C16	Same as C10	
C17	Same as C15	
C18	Same as C6	
C19	Same as C8	
C20, C21	Cap., ceramic, 0.002 mf ±10%, 3,000 vdc	CDK-20-015
C22	Same as C6	
C23	Not assigned	
C24	Cap., ceramic, 1,000 pf ±20%, 3,000 vdc	CDK-10-014
C25, C26	Same as C8	
C27, C28	Cap., ceramic, 470 pf ±20%, 1,000 vdc	CCJ-47-004
C101	Not assigned	
C102	Cap., elect., 50 mf -10 +100%, 40 vdc	CBP-50-064
C103, C104	Same as C24	
C105	Cap., mylar, 0.22 mf ±10%, 200 vdc	CGM-22-002
C106	Cap., elect., 60 mf -10 +100%, 12 vdc	CBP-60-095
C107	Cap., elect., 3.5 mf -10 +100%, 400 vdc	CBN-35-035
C108 thru C110, C113 thru C116	Not assigned	
C117	Cap., mylar, 0.01 mf ±10%, 200 vdc	CGL-10-002
C118	Cap., mica, 0.0018 mf ±2%, 500 vdc	CCK-18-003
C119, C120	Cap., mica, 100 pf ±5%, 500 vdc	CCJ-10-007
C122	Not assigned	

COMMON PARTS
MODELS LGS-6-5-OV-R — LGS-6-28-OV-R (Cont.)

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
C123	Cap., mylar, 0.1 mf ±10%, 200 vdc	CAM-10-012
C124	Cap., mylar, 0.47 mf ±10%, 200 vdc	CGM-47-016
C125, C126	Cap., mylar, 0.068 mf ±10%, 200 vdc	CGL-68-003
C127	Cap., mica, 680 pf ±10%, 300 vdc	CCJ-68-006
C128	Same as C118	
CR3, CR4	Not assigned	
CR5, CR6	Rectifier	FBL-00-064
CR7, CR8	Rectifier	FBL-00-054
CR9	Not assigned	
CR10, CR11	Same as CR7	
CR101, CR102	Rectifier	FBL-00-103
CR103	Rectifier	FBL-00-094
CR104	Not assigned	
CR105, CR106	Rectifier	FBL-00-105
CR107 thru CR111	Rectifier	FBL-00-082
CR112, CR113	Not assigned	
CR114 thru CR117	Same as CR12	
CR118 thru CR121	Same as CR105	
CR122 thru CR125	Same as CR12	
CR126, CR127	Same as CR107	
CR128	Not assigned	
CR129	Rectifier, zener diode	FBM-Z112
CR130	Not assigned	
CR131, CR132	Same as CR105	
CR133 thru CR146	Not assigned	
CR147	Same as CR5	
F1	Fuse, 15A, 3AB, NORM-BLO	FFJ-15-000
HC101	Hybrid circuit	FBH-00-002B
IC101	Integrated circuit	FBT-00-042
IC102	Integrated circuit	FBT-00-043
IC103	Integrated circuit	FBT-00-044
L2	Toroid	TCT-117-017

COMMON PARTS (Cont.)

MODELS LGS-6-5-OV-R — LGS-6-28-OV-R (Cont.)

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
L3	Choke, AC	BBA-GS6-3
L4	Choke, AC	BBA-GS6-2
L5, L6	Not assigned	
L7	Choke, output sense	BBA-GS5-4
L8	Choke, 0V	BBA-GS6-5
L9 thru L12	Toroid	TCT-027-003
L101, L102	Not assigned	
L103	Choke, current sense	BBA-GS6-1
Q1, Q2	Transistor, NPN	FBN-L200
**Q1, Q2	Transistor, NPN	FBN-L195
Q101, Q102	Transistor, NPN	FBN-L177
Q103, Q104	Transistor, PNP	FBN-L176
Q105, Q106	Transistor, PNP	FBN-L175
R1	Res., ww, 2,000 ohms ±3%, 25 w	DFS-20-089
R2	Not assigned	
R5	Res., ww, 0.4 ohm ±5%, 20 w	DFM-40-090
R6	Not assigned	
R7	Res., ww, 150 ohms ±5%, 30 w	DFR-15-111
R8, R11 thru R14	Not assigned	
R15, R16	Res., ww, 12 ohms ±5%, 30 w	DFP-12-057
R17, R18	Res., comp., 100 ohms ±10%, ½ w	DEB-1011
R101, R102	Res., comp., 330 ohms ±10%, ½ w	DEB-3311
R103	Res., comp., 10,000 ohms ±10%, ½ w	DEB-1031
R104, R105	Res., comp., 3,300 ohms ±10%, ½ w	DEB-3321
R106	Res., comp., 100 ohms ±10%, ½ w	DEB-1011
R107	Res., comp., 47 ohms ±10%, ½ w	DEB-4701
R109	Not assigned	
R110	Res., comp., 22,000 ohms ±10%, ½ w	DEB-2231
R111	Same as R103	
R112	Res., comp., 4,700 ohms ±10%, ½ w	DEB-4721
R113	Res., comp., 27,000 ohms ±10%, ½ w	DEB-2731
R114	Res., comp., 150,000 ohms ±5%, 1 w	DGB-1545
R115	Not assigned	
R116	Res., comp., 220 ohms ±10%, 1 w	DGB-2211
R117	Res., film, 12,900 ohms ±1%, ½ w	DCT-13-090
*R117	Res., film, 15,800 ohms ±1%, ¼ w	DCT-16-087
R118	Res., film, 3,480 ohms ±1%, ¼ w	
*R118	Res., film, 1,820 ohms ±1%, ¼ w	DCS-18-102
R120	Res., film, 20 ohms ±5%, ½ w	DCP-20-026

COMMON PARTS (Cont.)

MODELS LGS-6-5-OV-R — LGS-6-28-OV-R (Cont.)

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
R124	Not assigned	
R125	Res., var., cermet, 2,000 ohms ±10%, 1 w	DRS-20-018
R126	Res., comp., 2.7 ohms ±10%, ¼ w	DCB-27G1
R127	Same as R106	
R129	Same as R116	
R130	Res., ww, 750 ohms ±3%, 3 w	DFR-75-085
R131, R132	Res., comp., 1.0 ohm ±10%, ½ w	DEB-10G1
R133 thru R139	Not assigned	
S1	Thermostat	FKA-110-026
SCR1 thru SCR4	Not assigned	
SCR5, SCR6	Rectifier, silicon controlled	FBP-00-048
SCR101	Rectifier, silicon controlled	FBP-00-045
XF1	Fuseholder	HRM-00-009

*Only used on units with serial no. prefixes A-C.
**Only used on units with serial no. prefixes B & C.

UNIQUE PARTS

MODEL LGS-6-5-OV-R

C3	Cap., elect., 60,000 mf -10 +100%, 7.5 vdc	CBT-60-068
C4, C5	Cap., ceramic, 0.02 mf ±20%, 1,400 vdc	CDL-20-003
C111, C112	Not assigned	
C121	Cap., mylar, 0.33 mf ±10%, 80 vdc	CGM-33-012
CR1, CR2	Rectifier	FBL-00-119
HC1	Hybrid circuit	L-20-OV-5
L1	Filter choke	BBA-LGS6-5
R3, R4	Res., comp., 12 ohms ±10%, 1 w	DGB-1201
R9	Res., ww, 25 ohms ±3%, 5 w	DFP-25-066
R10	Res., ww, 12 ohms ±5%, 30 w	DFP-12-057
R19	Res., var., cermet, 5,000 ohms ±20%, 1 w	DRS-50-020
R108	Res., comp., 1,500 ohms ±10%, ½ w	DEB-1521
R119, R121 thru R123, R128	Not assigned	
*T1	Transformer	ABA-LGS6-5-1
T1	Transformer	ABA-LGS6-5-2

MODEL LGS-6-6-OV-R

C3	Cap., elect., 60,000 mf -10 +100%, 7.5 vdc	CBT-60-068
C4, C5	Cap., ceramic, 0.02 mf ±20%, 1,400 vdc	CDL-20-003
C111, C112	Not assigned	

UNIQUE PARTS (Cont.)

MODEL LGS-6-6-OV-R (Cont.)

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
C121	Cap., mylar, 0.33 mf ±10%, 80 vdc	CGM-33-012
CR1, CR2	Rectifier	FBL-00-119
HC1	Hybrid circuit	L-20-OV-6
L1	Filter choke	BBA-LGS6-5
R3, R4	Res., comp., 12 ohms ±10%, 1 w	DGB-1201
R9	Res., ww, 25 ohms ±3%, 5 w	DFP-25-066
R10	Res., ww, 16 ohms ±5%, 30 w	DFP-16-058
R19	Res., var., cermet, 5,000 ohms ±20%, 1 w	DRS-50-020
R108	Res., comp., 1,500 ohms ±10%, ½ w	DEB-1521
R119, R121 thru R123, R128	Not assigned	
*T1	Transformer	ABA-LGS6-6-1
T1	Transformer	ABA-LGS-6-6-2

MODEL LGS-6-12-OV-R

C3	Cap., elect., 40,000 mf -10 +100%, 15 vdc	CBT-40-067
C4, C5	Cap., ceramic, 0.02 mf ±20%, 1,400 vdc	CDL-20-003
C111	Cap., mylar, 0.1 mf ±10%, 200 vdc	CAM-10-012
C112	Cap., mylar, 0.47 mf ±10%, 200 vdc	CGM-47-016
C121	Not assigned	
CR1, CR2	Rectifier	FBL-00-118
CR148	Rectifier	FBL-00-082
HC1	Hybrid circuit	L-20-OV-12
L1	Filter choke	BBA-LGS6-12
**L13A, B	"I" Bar "U" Bar	TCI-375-004 TCU-375-003
Q107	Transistor, PNP	FBN-L118
Q108	Transistor, NPN	FBN-L110
R3, R4	Res., comp., 22 ohms ±10%, 1 w	DGB-2201
R9	Res., ww, 100 ohms ±3%, 5 w	DFR-10-025
R10	Res., ww, 12 ohms ±5%, 30 w	DFP-12-057
R19	Res., var., cermet, 5,000 ohms ±20%, 1 w	DRS-50-020
R108	Not assigned	
R119	Res., film, 7,500 ohms ±1/, ¼ w	DCS-75-072
R121	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
R122	Res., comp., 10,000 ohms ±10%, ½ w	DEB-1031
R123	Res., comp., 100,000 ohms ±10%, ½ w	DEB-1041
R128	Same as R122	
R140	Res., comp., 68 ohms ±10%, ½ w	DEB-6801
R141	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731

UNIQUE PARTS (Cont.)

MODEL LGS-6-12-OV-R (Cont.)

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
*T1	Transformer	ABA-LGS-6-12-1
T1	Transformer	ABA-LGS-6-12-2

MODEL LGS-6-15-OV-R

C3	Cap., elect., 25,000 mf -10 +100%, 25 vdc	CBT-25-066
C4, C5	Cap., ceramic, 0.02 mf ±20%, 1,400 vdc	CDL-20-003
C111	Cap., mylar, 0.1 mf ±10%, 200 vdc	CAM-10-012
C112	Cap., mylar, 0.47 mf ±10%, 200 vdc	CGM-47-016
C121	Not assigned	
CR1, CR2	Rectifier	FBL-00-118
CR148	Rectifier	FBL-00-082
HC1	Hybrid circuit	L-20-OV-15
L1	Filter choke	BBA-LGS6-15
**L13A, B	"I" Bar "U" Bar	TCI-375-004 TCU-375-003
Q107	Transistor, PNP	FBN-L118
Q108	Transistor, NPN	FBN-L110
R3, R4	Res., comp., 22 ohms ±10%, 1 w	DGB-2201
R9	Res., ww, 110 ohms ±3%, 5 w	DFR-11-115
R10	Res., ww, 12 ohms ±5%, 30 w	DFP-12-057
R19	Res., var., cermet, 5,000 ohms ±20%, 1 w	DRS-50-020
R108	Not assigned	
R119	Res., film, 10,000 ohms ±1%, ¼ w	DCT-10-047
R121	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
R122	Res., comp., 10,000 ohms ±10%, ½ w	DEB-1031
R123	Res., comp., 100,000 ohms ±10%, ½ w	DEB-1041
R128	Same as R122	
R140	Res., comp., 68 ohms ±10%, ½ w	DEB-6801
R141	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
*T1	Transformer	ABA-LGS6-15-1
T1	Transformer	ABA-LGS-6-15-2

MODEL LGS-6-20-OV-R

C3	Cap., elect., 18,000 mf -10 +100%, 30 vdc	CBT-18-065
C4, C5	Cap., ceramic, 0.01 mf ±20%, 1,000 vdc	CDL-10-004
C111	Cap., mylar, 0.1 mf ±10%, 200 vdc	CAM-10-012
C112	Cap., mylar, 0.47 mf ±10%, 200 vdc	CGM-47-016
C121	Not assigned	
CR1, CR2	Rectifier	FBL-00-140
CR148	Rectifier	FBL-00-082
HC1	Hybrid circuit	L-20-OV-20
L1	Filter choke	BBA-LGS6-20
**L13A, B	"I" Bar "U" Bar	TCI-375-004 TCU-375-003

*Only used on units with serial no. prefixes A-C.
**Not used on units with serial no. prefixes A-D

UNIQUE PARTS (Cont.)

MODEL LGS-6-20-OV-R (Cont.)

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
Q107	Transistor, PNP	FBN-L118
Q108	Transistor, NPN	FBN-L110
R3, R4	Res., comp., 33 ohms ±10%, 1 w	DGB-3301
R9	Res., ww, 150 ohms ±5%, 10 w	DFR-15-116
R10	Res., ww, 16 ohms ±5%, 30 w	DFP-16-058
R19	Res., var., cermet, 10,000 ohms ±10%, 1 w	DRT-10-048
R108	Not assigned	
R119	Res., film, 13,300 ohms ±1%, ¼ w	DCT-13-067
R121	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
R122	Res., comp., 10,000 ohms ±10%, ½ w	DEB-1031
R123	Res., comp., 100,000 ohms ±10%, ½ w	DEB-1041
R128	Same as R122	
R140	Res., comp., 68 ohms ±10%, ½ w	DEB-6801
R141	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
*T1	Transformer	ABA-LGS6-20-1
T1	Transformer	ABA-LGS-6-20-2

MODEL LGS-6-24-OV-R

C3	Cap., elect., 14,000 ohms -10 +100%, 40 vdc	CBT-14-064
C4, C5	Cap., ceramic, 0.01 mf ±20%, 1,000 vdc	CDL-10-004
C111	Cap., mylar, 0.1 mf ±10%, 200 vdc	CAM-10-012
C112	Cap., mylar, 0.47 mf ±10%, 200 vdc	CGM-47-016
C121	Not assigned	
CR1, CR2	Rectifier	FBL-00-140
CR148	Rectifier	FBL-00-082
HC1	Hybrid circuit	L-20-OV-24
L1	Filter choke	BBA-LGS6-24
**L13A, B	"I" Bar	TCI-375-004
	"U" Bar	TCU-375-003
Q107	Transistor, PNP	FBN-L118
Q108	Transistor, NPN	FBN-L110
R3, R4	Res., comp., 33 ohms ±10%, 1 w	DGB-3301
R9	Res., ww, 150 ohms ±5%, 10 w	DFR-15-116
R10	Res., ww, 16 ohms ±5%, 30 w	DFP-16-058
R19	Res., var., cermet, 10,000 ohms ±10%, 1 w	DRT-10-048
R108	Not assigned	
R119	Res., film, 18,200 ohms ±1%, ¼ w	DCT-18-068

UNIQUE PARTS (Cont.)

MODEL LGS-6-24-OV-R (Cont.)

CIRC. DESIG.	DESCRIPTION	LAMBDA NO.
R121	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
R122	Res., comp., 10,000 ohms ±10%, ½ w	DEB-1031
R123	Res., comp., 100,000 ohms ±10%, ½ w	DEB-1041
R128	Same as R122	
R140	Res., comp., 68 ohms ±10%, ½ w	DEB-6801
R141	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
*T1	Transformer	ABA-LGS6-24-1
T1	Transformer	ABA-LGS-6-24-2

MODEL LGS-6-28-OV-R

C3	Cap., elect., 14,000 mf -10 +100%, 40 vdc	CBT-14-064
C4, C5	Cap., ceramic, 0.01 mf ±20%, 1,000 vdc	CDL-10-004
C111	Cap., mylar, 0.1 mf ±10%, 200 vdc	CAM-10-012
C112	Cap., mylar, 0.47 mf ±10%, 200 vdc	CGM-47-016
C121	Not assigned	
CR1, CR2	Rectifier	FBL-00-140
CR148	Rectifier	FBL-00-082
HC1	Hybrid circuit	L-20-OV-28
L1	Filter choke	BBA-LGS6-24
**L13A, B	"I" Bar	TCI-375-004
	"U" Bar	TCU-375-003
Q107	Transistor, PNP	FBN-L118
Q108	Transistor, NPN	FBN-L110
R3, R4	Res., comp., 33 ohms ±10%, 1 w	DGB-3301
R9	Res., ww, 220 ohms ±3%, 10 w	DFR-22-118
R10	Res., ww, 16 ohms ±5%, 30 w	DFP-16-058
R19	Res., var., cermet, 10,000 ohms ±10%, 1 w	DRT-10-048
R108	Not assigned	
R119	Res., film, 20,000 ohms ±1%, ¼ w	DCT-20-053
R121	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
R122	Res., comp., 10,000 ohms ±10%, ½ w	DEB-1031
R123	Res., comp., 100,000 ohms ±10%, ½ w	DEB-1041
R128	Same as R122	
R140	Res., comp., 68 ohms ±10%, ½ w	DEB-6801
R141	Res., comp., 47,000 ohms ±10%, ½ w	DEB-4731
*T1	Transformer	ABA-LGS6-28-1
T1	Transformer	ABA-LGS6-28-2

*Only used on units with serial no. prefixes A-C.
**Not used on units with serial no. prefixes A-D.

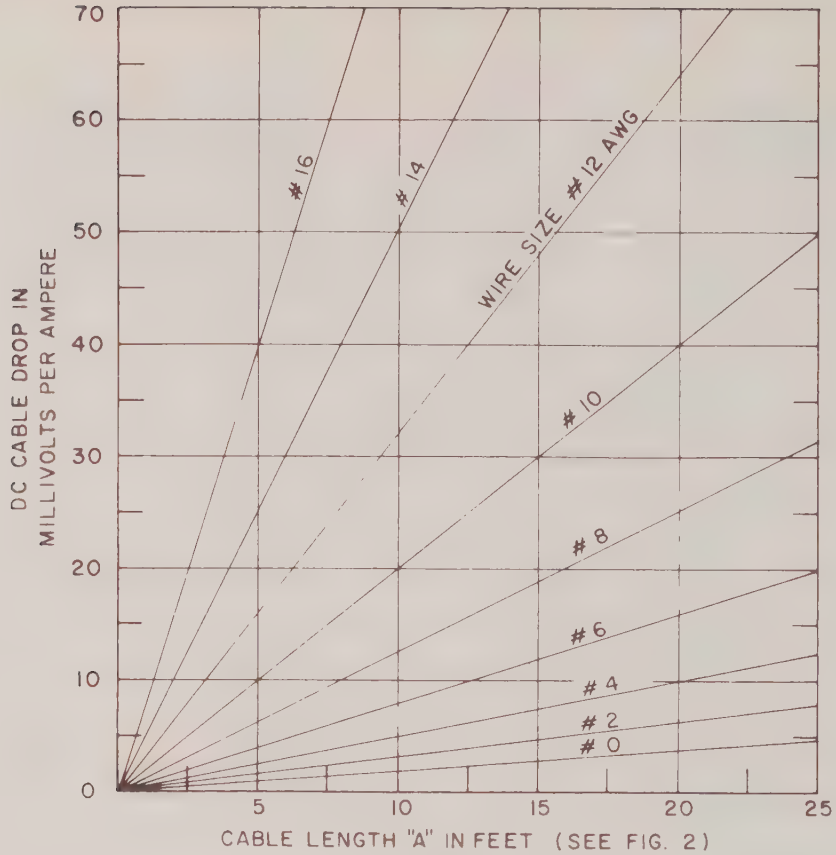


Figure 1. Cable Connection Chart.

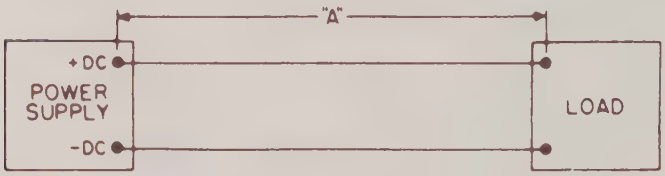
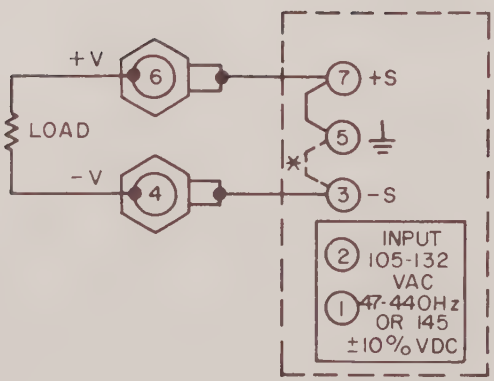


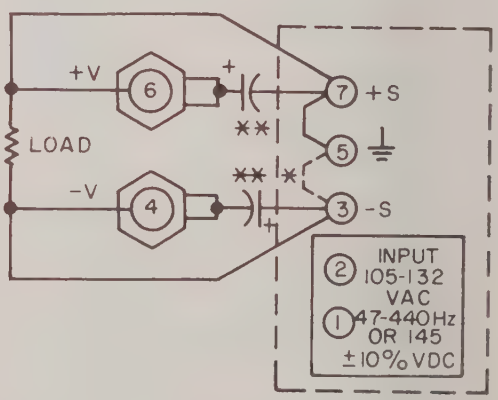
Figure 2. Cable Length "A" in Feet.



NOTE

* FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS 5 AND 7 AND RECONNECT TO TERMINALS 5 AND 3.

Figure 3. Local Sensing Connections.

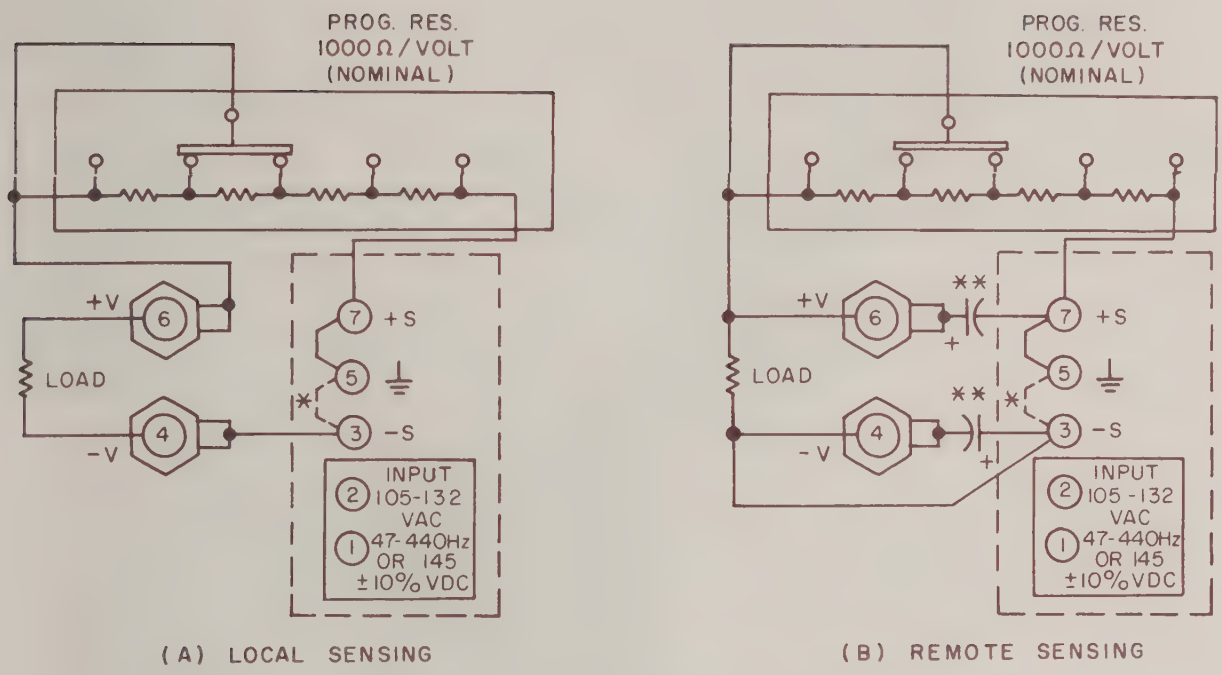


NOTE

* FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS 5 AND 7 AND RECONNECT TO TERMINALS 5 AND 3.

** A 2.5MF, ELECT., CAP. MAY BE REQUIRED.

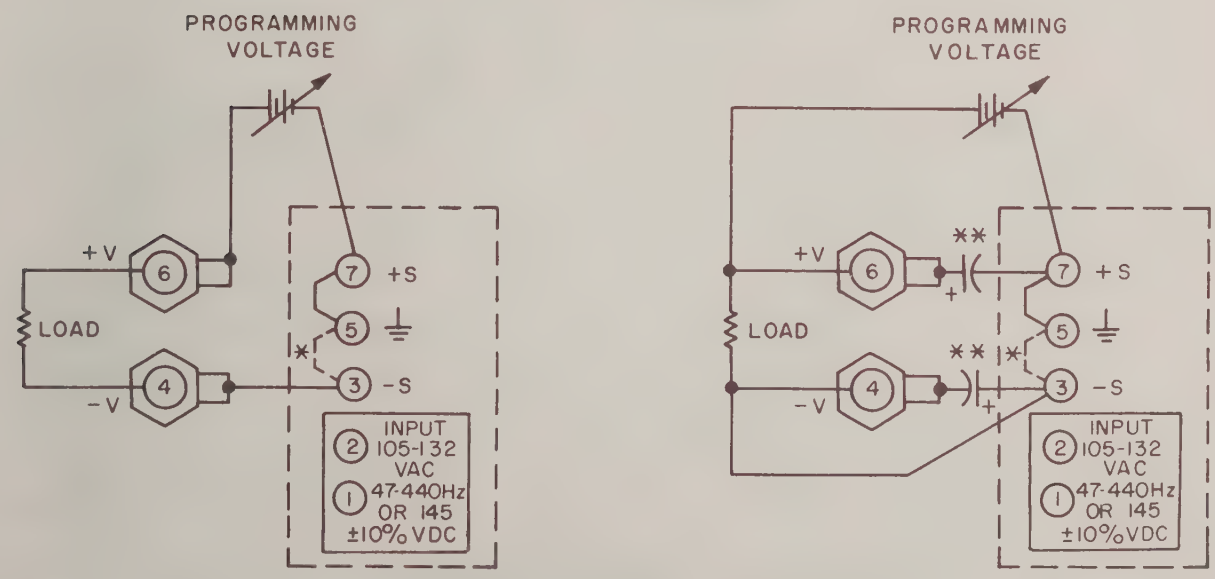
Figure 4. Remote Sensing Connections.



NOTES: * FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS 5 AND 7 AND RECONNECT TO TERMINALS 3 AND 5.

** A 2.5MF, ELECT., CAP. MAY BE REQUIRED.

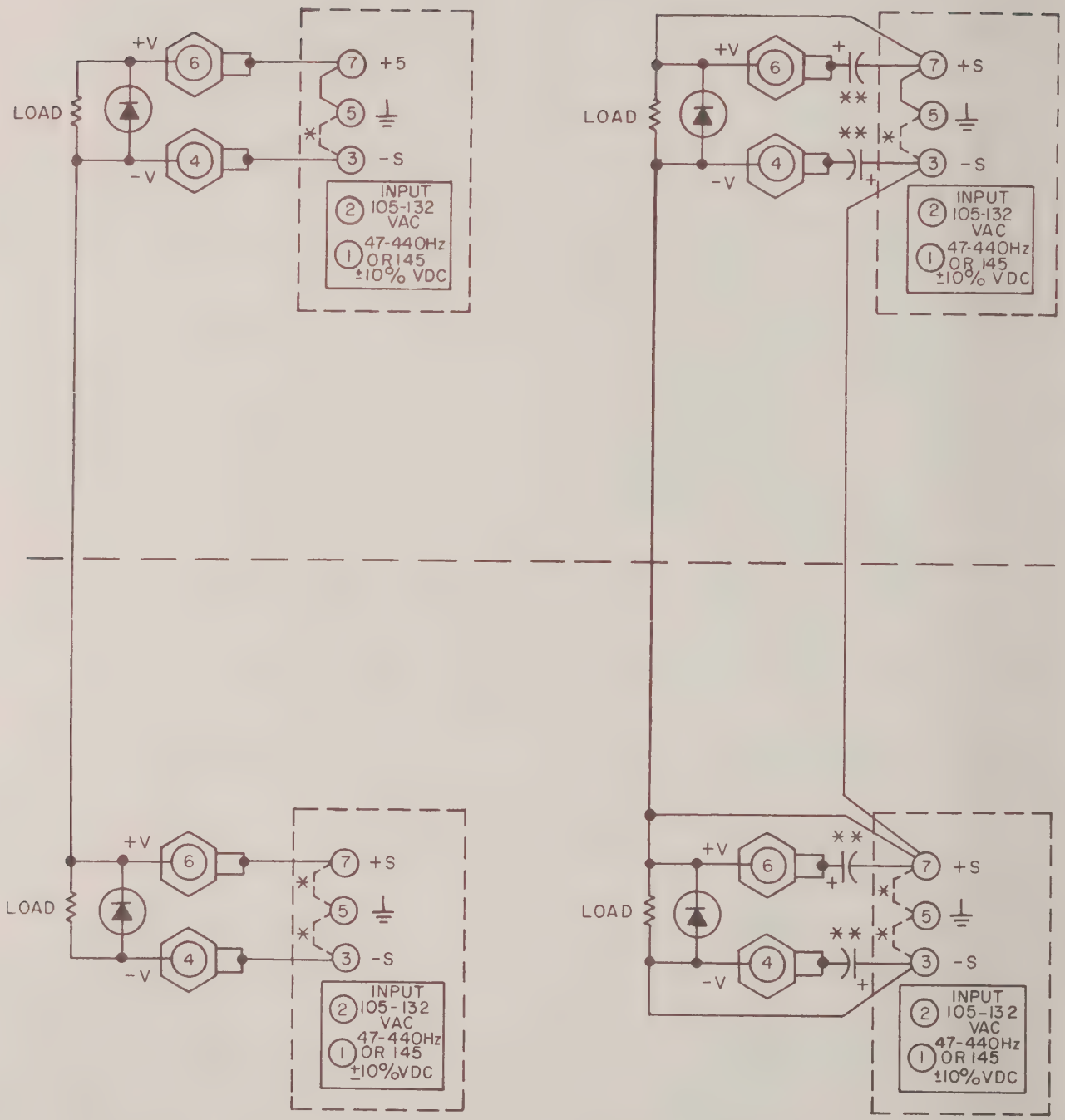
Figure 5. Programmed Voltage, With External Resistor.



NOTES: * FOR NEGATIVE GROUND, DISCONNECT JUMPER FROM TERMINALS 5 AND 7 AND RECONNECT TO TERMINALS 3 AND 5.

** A 2.5MF, ELECT., CAP. MAY BE REQUIRED.

Figure 6. Programmed Voltage, With External Programming Voltage Source.



(A) LOCAL SENSING

(B) REMOTE SENSING

NOTES:

* MAKE ONLY ONE GROUND CONNECTION FOR SERIES COMBINATION. TO CHANGE GROUND AS SHOWN, REMOVE JUMPER FROM TERMINALS 5 AND 7 ON TOP UNIT AND CONNECT ANY ONE OF THE OTHER JUMPERS AS SHOWN IN DOTTED LINE.

** A 2.5MF, ELECT., CAP. MAY BE REQUIRED.

Figure 7. Series Connection.

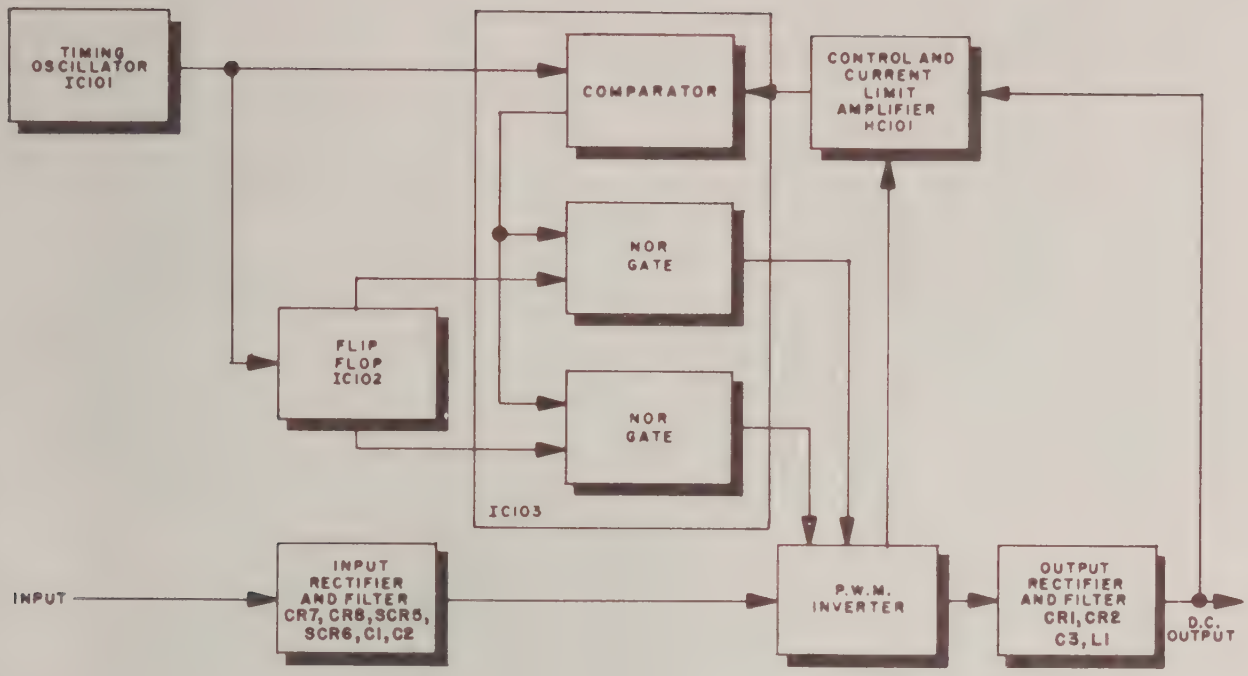


Figure 8. Typical Block Diagram.

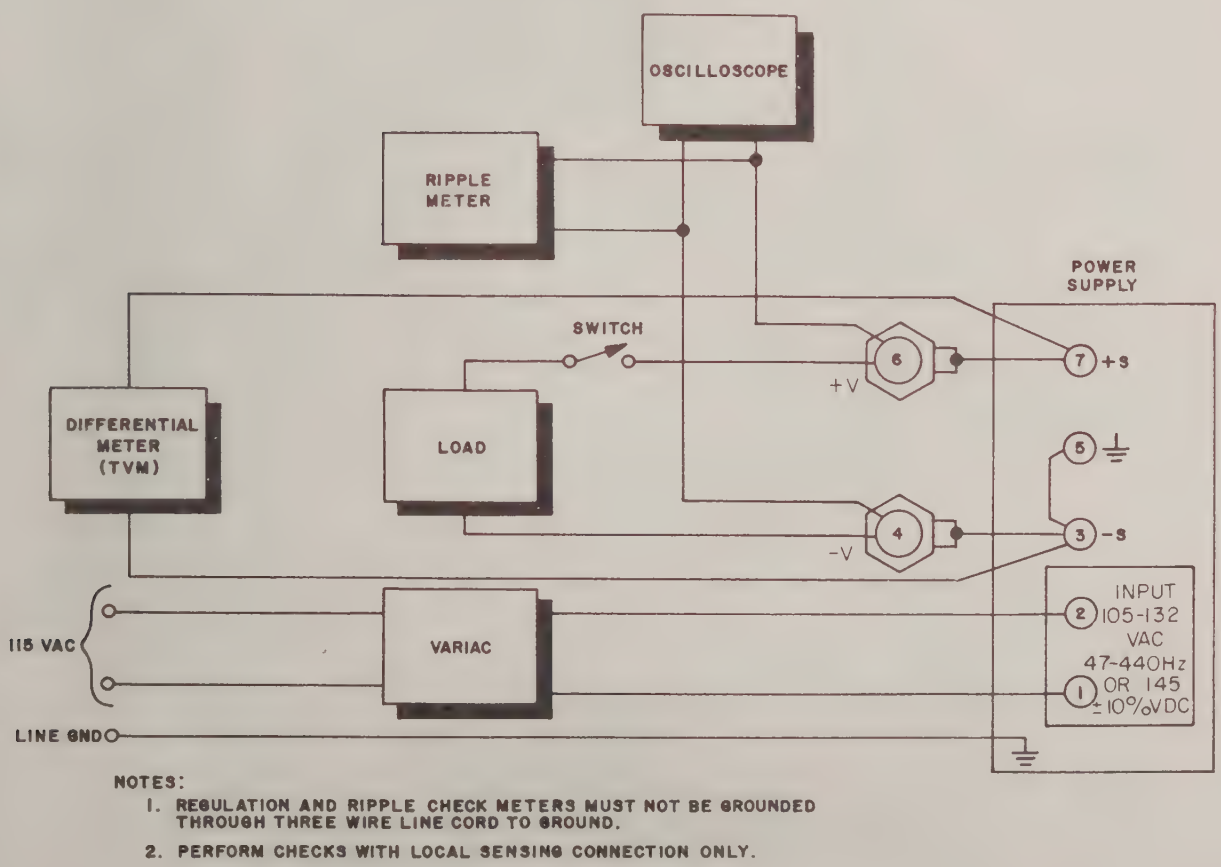


Figure 9. Test Connections for Performance Checks.

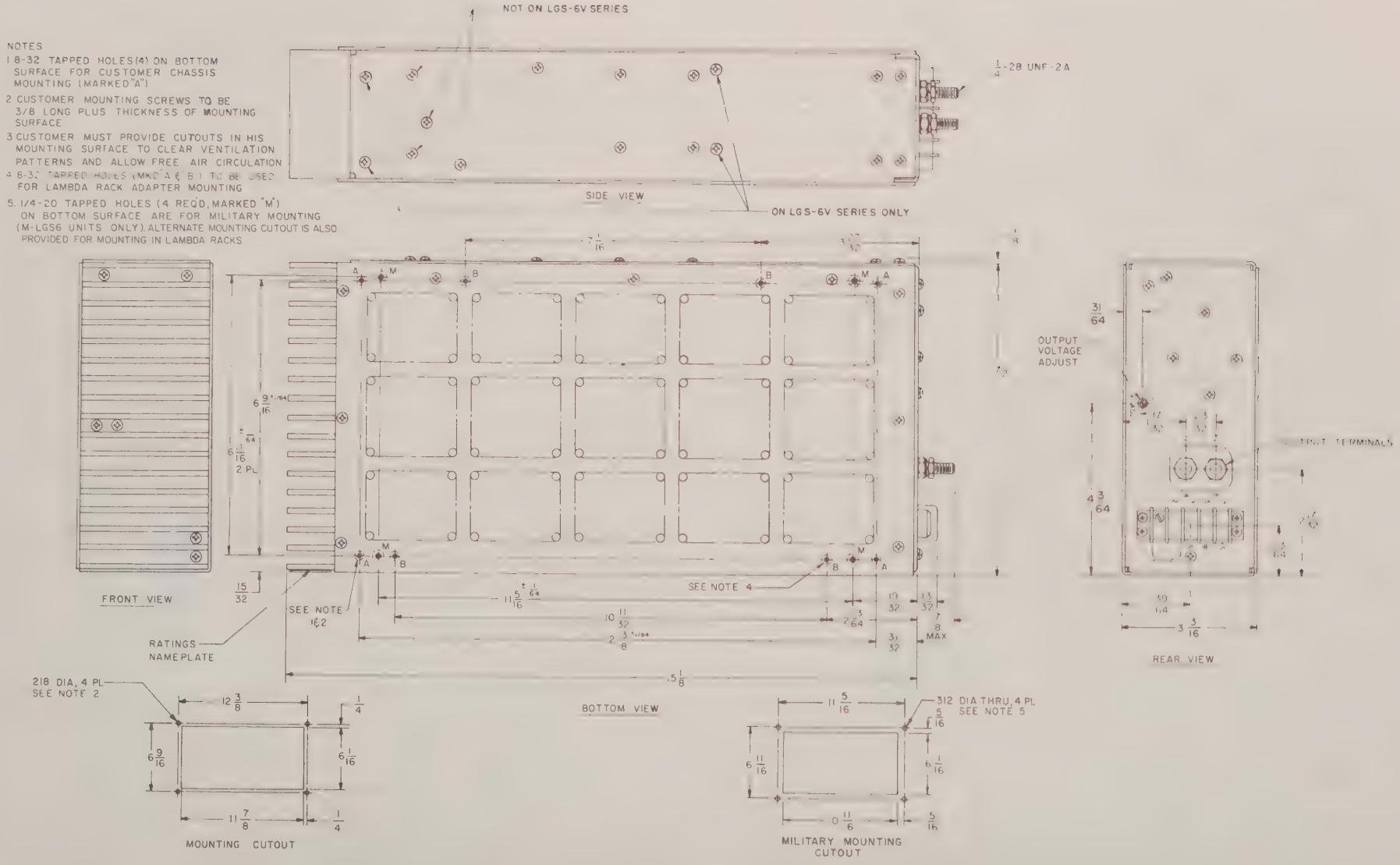
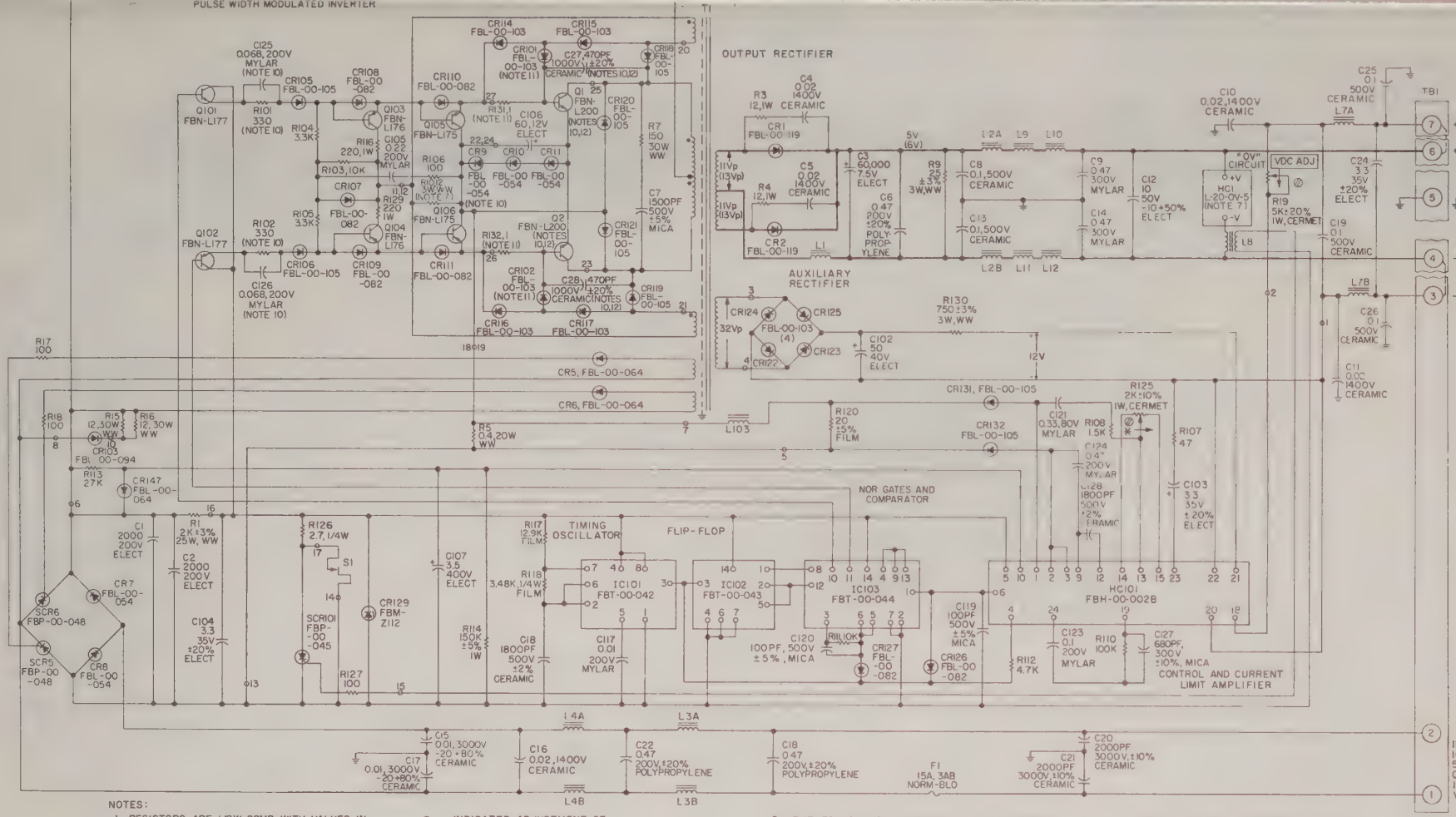
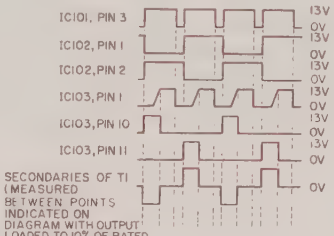

NOTES
1 8-32 TAPPED HOLES (4) ON BOTTOM SURFACE FOR CUSTOMER CHASSIS MOUNTING (MARKED "A")
2 CUSTOMER MOUNTING SCREWS TO BE 3/8 LONG PLUS THICKNESS OF MOUNTING SURFACE
3 CUSTOMER MUST PROVIDE CUTOUTS IN HIS MOUNTING SURFACE TO CLEAR VENTILATION PATTERNS AND ALLOW FREE AIR CIRCULATION
4 8-32 TAPPED HOLES (MKD A & B) TO BE USED FOR LAMBDA RACK ADAPTER MOUNTING
5. 1/4-20 TAPPED HOLES (4 REQD, MARKED "M") ON BOTTOM SURFACE ARE FOR MILITARY MOUNTING (M-LGS6 UNITS ONLY). ALTERNATE MOUNTING CUTOUT IS ALSO PROVIDED FOR MOUNTING IN LAMBDA RACKS
NOT ON LGS-6V SERIES
1/4-28 UNF-2A
SIDE VIEW
ON LGS-6V SERIES ONLY
FRONT VIEW
SEE NOTE 1&2
RATINGS NAMEPLATE
SEE NOTE 4
BOTTOM VIEW
OUTPUT VOLTAGE ADJUST
REAR VIEW
.218 DIA, 4 PL SEE NOTE 2
MOUNTING CUTOUT
.312 DIA THRU, 4 PL SEE NOTE 5
MILITARY MOUNTING CUTOUT

Figure 10. Outline Drawing.



NOTES:

1. RESISTORS ARE 1/2W COMP WITH VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.
3. RESISTOR TOLERANCES COMP ±10%, FILM ±1%, WIREWOUND ±5%.
4. CAPACITOR TOLERANCES: ELECTROLYTIC -10 +100%, CERAMIC ±20%, MYLAR ±10%, UNLESS OTHERWISE NOTED.
5. SYMBOLS:
   - ▭ INDICATES ACTUAL UNIT MARKING.
   - ↓ INDICATES CLOCKWISE ROTATION OF SHAFT.
   - ✱ SEE INSTRUCTION MANUAL.
   - —o— INDICATES TERMINAL ON PRINTED WIRING BOARD OR TERMINAL BOARD
6. ⌀ INDICATES ADJUSTMENT OR CALIBRATION CONTROL.
6. DESIGNATIONS ARE LAMBDA PART NUMBERS.
7. ON MODEL LGS-6-6-0V-R: HC1 IS L-20-0V-6, R10 IS 16,30W,WW.
8. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS: INPUT: 115 VAC, 57-63 Hz NOMINAL OUTPUT VOLTAGE, NO LOAD, +S AND +V SHORTED, -S AND -V SHORTED INDICATED VOLTAGES ARE TYPICAL VALUES AND ARE DC UNLESS OTHERWISE NOTED. DC MEASUREMENTS TAKEN WITH 20,000 OHMS/V VOLTMETER, AC MEASUREMENTS ARE PEAK VALUES MEASURED WITH OSCILLOSCOPE. VOLTAGES ARE TAKEN BETWEEN INDICATED POINTS AND -S (TERM 3) UNLESS OTHERWISE NOTED. VOLTAGES IN PARENTHESIS APPLY TO MODEL LGS-6-6-0V-R. A SINGLE READING APPLIES TO BOTH MODELS.
9. THE FOLLOWING WAVEFORMS CAN BE OBSERVED BETWEEN INDICATED POINTS AND C1(-) UNLESS OTHERWISE NOTED:


IC101, PIN 3
IC102, PIN 1
IC102, PIN 2
IC103, PIN 1
IC103, PIN 10
IC103, PIN 11
13V
0V
SECONDARIES OF T1 (MEASURED BETWEEN POINTS INDICATED ON DIAGRAM WITH OUTPUT LOADED TO 10% OF RATED CURRENT MINIMUM.)

10. ON UNITS WITH SERIAL NO. PREFIX A C125, C126 ARE 0.047, Q1, Q2 ARE FBN-L178; R101, R102 ARE 470; C27, C28 ARE NOT USED. CR9 IS A JUMPER ON UNITS WITH SERIAL NO. PREFIXES FROM B ON.
11. ON UNITS WITH SERIAL NO PREFIXES A&B, CR101, CR102 ARE NOT USED, R131, R132 ARE JUMPERS.
12. ON UNITS WITH SERIAL NO. PREFIX D: C27, C28 ARE NOT USED ON UNITS WITH SERIAL NO. PREFIX C: Q1, Q2 ARE FBN L195, R117 IS 15.8K 1/4W, R118 IS 1.82K.

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS.

DOTTED CONNECTIONS SHOWN ON TB1 INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTION.

THIS SCHEMATIC APPLIES TO UNITS BEARING SERIAL NO. PREFIXES A-F.

SCHEMATIC DIAGRAM

REGULATED POWER SUPPLY

MODELS
LGS-6-5-0V-R
LGS-6-6-0V-R

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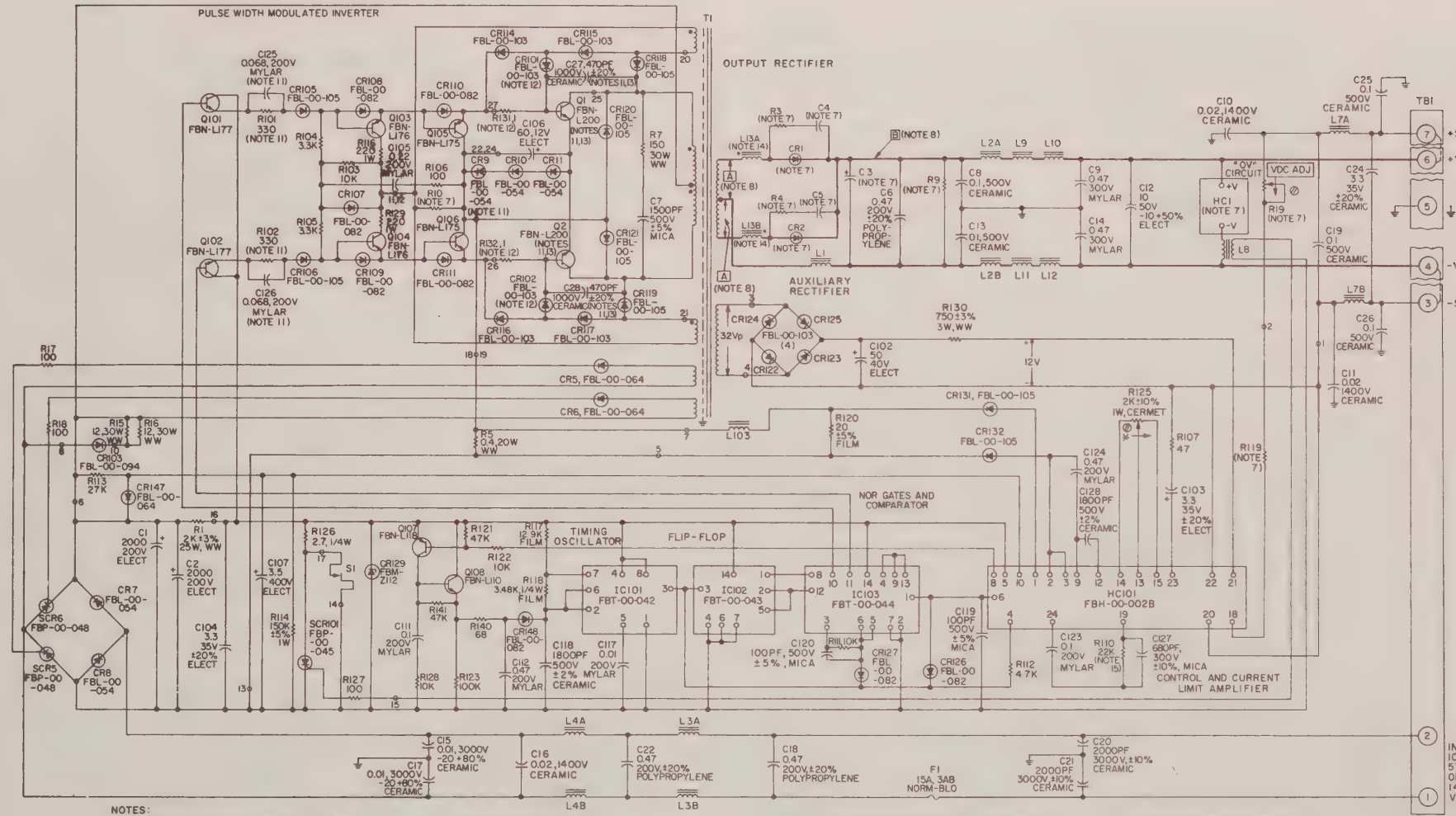
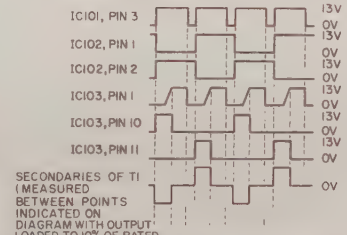


NOTES:

1. RESISTORS ARE 1/2W COMP. WITH VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE NOTED.
3. RESISTOR TOLERANCES: COMP ± 10%, FILM ±1%, WIREWOUND ± 5%.
4. CAPACITOR TOLERANCES: ELECTROLYTIC -10 +100%, CERAMIC ± 20%, MYLAR ± 10%, UNLESS OTHERWISE NOTED.
5. SYMBOLS:
   - ▭ INDICATES ACTUAL UNIT MARKING.
   - ↓ INDICATES CLOCKWISE ROTATION OF SHAFT.
   - ✱ SEE INSTRUCTION MANUAL.
   - —o— INDICATES TERMINAL ON PRINTED WIRING BOARD OR TERMINAL BOARD
   - ⌀ INDICATES ADJUSTMENT OR CALIBRATION CONTROL.
6. DESIGNATIONS ARE LAMBDA PART NUMBERS
7. SEE TABLE I FOR COMPONENT VALUES
8. SEE TABLE I FOR VOLTAGE VALUES.
9. CONDITIONS FOR CIRCUIT POINT MEASUREMENTS: INPUT: 115 VAC, 57-63 Hz NOMINAL OUTPUT VOLTAGE, NO LOAD, +S AND +V SHORTED, -S AND -V SHORTED. INDICATED VOLTAGES ARE TYPICAL VALUES AND ARE DC UNLESS OTHERWISE NOTED. DC MEASUREMENTS TAKEN WITH 20,000 OHMS/V VOLTMETER, AC MEASUREMENTS ARE PEAK VALUES MEASURED WITH OSCILLOSCOPE. VOLTAGES ARE TAKEN BETWEEN INDICATED POINTS AND -S (TERM 3) UNLESS OTHERWISE NOTED.
10. THE FOLLOWING WAVEFORMS CAN BE OBSERVED BETWEEN INDICATED POINTS AND CI(-) UNLESS OTHERWISE NOTED.


IC101, PIN 3
IC102, PIN 1
IC102, PIN 2
IC103, PIN 1
IC103, PIN 10
IC103, PIN 11
SECONDARIES OF TI (MEASURED BETWEEN POINTS INDICATED ON DIAGRAM WITH OUTPUT LOADED TO 10% OF RATED CURRENT MINIMUM.)
13V
0V

11. ON UNITS WITH SERIAL NO PREFIX A: C125, C126 ARE 0.047, Q1, Q2 ARE FBN-L178; R101, R102 ARE 470; C27, C28 ARE NOT USED. CR9 IS A JUMPER ON UNITS WITH SERIAL NO. PREFIXES FROM B ON.
12. ON UNITS WITH SERIAL NO. PREFIXES A &B: CR101, CR102 ARE NOT USED; R131, R132 ARE JUMPERS.
13. ON UNITS WITH SERIAL NO. PREFIX D: C27, C28 ARE NOT USED. ON UNITS WITH SERIAL NO. PREFIX C: Q1, Q2 ARE FBN-L195, R117 IS 15.8K 1/4W, R118 IS 1.82K.
14. NOT USED ON UNITS WITH SERIAL NO. PREFIXES A-D
15. R110 WAS 100K ON UNITS WITH SERIAL NO. PREFIXES A-E.

FOR WIRING OF POWER SUPPLY TO LOAD REFER TO SUPPLY-TO-LOAD WIRING DIAGRAMS.

DOTTED CONNECTIONS SHOWN ON TBI INDICATE JUMPERS IN PLACE FOR LOCAL SENSING CONNECTION.

THIS SCHEMATIC APPLIES TO UNITS BEARING SERIAL NO PREFIXES A-F.

SCHEMATIC DIAGRAM
REGULATED POWER SUPPLY

MODELS
LGS-6-12-0V-R
LGS-6-15-0V-R
LGS-6-20-0V-R
LGS-6-24-0V-R
LGS-6-28-0V-R

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TABLE I
SCHEMATIC DATA REFERENCES
MODELS LGS-6-12-OV-R THRU LGS-6-28-OV-R

Models	Schematic Voltage Measurements		Schematic Components								
			C3	C4, C5	CR1, CR2	HC1	R3, R4	R9	R10	R19	R119
	A (Vp)	B (VDC)	-10+100% ELECT	±20% CERAMIC	FBL-00-*	L-20-OV-*	±10%, 1 w COMP	5w WW	±5%, 30 w WW	1 w CERMET	±1%, 1/4 w FILM
LGS-6-12-OV-R	21.0	12.0	40,000 mf 15 vdc	0.02 mf 1,400 vdc	118	12	22	100±3%	12	5K±20%	7.5K
LGS-6-15-OV-R	26.0	15.0	25,000 mf 20 vdc	0.02 mf 1,400 vdc	118	15	22	100±3%	12	5K±20%	10K
LGS-6-20-OV-R	35.0	20.0	18,000 mf 30 vdc	0.01 mf 1,000 vdc	140	20	33	150±5%	16	10K±10%	13.3K
LGS-6-24-OV-R	40.0	24.0	14,000 mf 40 vdc	0.01 mf 1,000 vdc	140	24	33	150±5%	16	10K±10%	18.2K
LGS-6-28-OV-R	46.0	28.0	14,000 mf 40 vdc	0.01 mf 1,000 vdc	140	28	33	220±3%	16	10K±10%	20K

*Lambda part no.

ADDENDA

MLG SERIES
REGULATED SWITCHING POWER SUPPLIES

The instructions, procedures and specifications included in this manual apply to the MLG SERIES power supply except as noted here. In addition the MLG SERIES power supplies meet the following MIL STANDARDS:

MIL-STANDARDS	MLG SERIES
MIL-STD-810C Low Pressure	Method 500.1 Proc. 1
MIL-STD-810C High Temp	Method 501.1 Proc. 1, 2
MIL-STD-810C Low Temp	Method 502.1 Proc. 1
MIL-STD-810C Temp. Shock	Method 503.1 Proc. 1
MIL-STD-810C Temp. Alt	Method 504.1 Proc. 1 Class 2 (-20°C operating)
MIL-STD-810C Humidity	Method 507.1 Proc. 1, 2
MIL-STD-810C Fungus	Method 508.1 Proc. 1
MIL-STD-810C Salt Fog	Method 509.1 Proc. 1
MIL-STD-810C Sand & Dust	Method 510.1 Proc. 1
MIL-STD-810C Explosive Atmosphere	Method 511.1 Proc. 1, 4
MIL-STD-810C Vibration	Method 514.2 Proc. 8,10,11
MIL-STD-810C Shock	Method 516.2 Proc. 1,3,5
MIL-STD-810C Temp. -Humidity-Alt	Method 518.1 Proc. 1
MIL-STD-901C High Shock	Grade A, Class 1, Type A
MIL-1-6181D RFI (Conducted)	Yes
MIL-STD-461 RFI (Conducted)	Yes - with ext. filter
MIL-STD-1399 Voltage Transient	Type I, 115V input only
MIL-T-27C Transformer	Grade 5

NOTE

MLGS-6 models use rack adapters LRA-7, LRA-8 and LRA-11 for standard mounting with or without chassis slides.

PARTS LIST

MLGS-6 MODELS

The following parts are deleted from or are changed on the MLGS-6 series power supplies.

COMMON PARTS

MODELS MLGS-6-5-OV — MLGS-6-28-OV

CIRC. DESG.	DESCRIPTION	LAMBDA NO.
F101	Fuse, not used	
R125	Res., var., ww, 2,000 ohms ±10%, ½ w	DRS-20-031
S1	Thermostat	FKA-110-048
XF101	Fuseholder, not used	

UNIQUE PARTS

MODEL MLGS-6-5-OV

HC-1	Protector, overvoltage	FHE-OV-009
L1	Choke, filter	BBA-LGS-6-5M
R19	Res., var., ww, 5,000 ohms ±10%, ½ w	DRS-50-030
T1	Transformer	ABA-LGS-6-5M

UNIQUE PARTS (Cont.)

MODEL MLGS-6-6-OV

CIRC. DESG.	DESCRIPTION	LAMBDA NO.
HC-1	Protector, overvoltage	FHE-OV-010
L1	Choke, filter	BBA-LGS-6-5M
R19	Res., var., ww, 5,000 ohms ±10%, ½ w	DRS-50-030
T1	Transformer	ABA-LGS-6-6M

MODEL MLGS-6-12-OV

HC-1	Protector, overvoltage	FHE-OV-010
L1	Choke, filter	BBA-LGS-6-12M
R19	Res., var., ww, 5,000 ohms ±10%, ½ w	DRS-50-030
T1	Transformer	ABA-LGS-6-12M

UNIQUE PARTS (Cont.)
MODEL MLGS-6-15-OV

CIRC. DESC.	DESCRIPTION	LAMBDA NO.
HC1	Protector, overvoltage	FHE-OV-010
L1	Choke, filter	BBA-LGS-6-15M
R19	Res., var., ww, 5,000 ohms ±10%, ½ w	DRS-50-030
T1	Transformer	ABA-LGS-6-15M

MODEL MLGS-6-20-OV

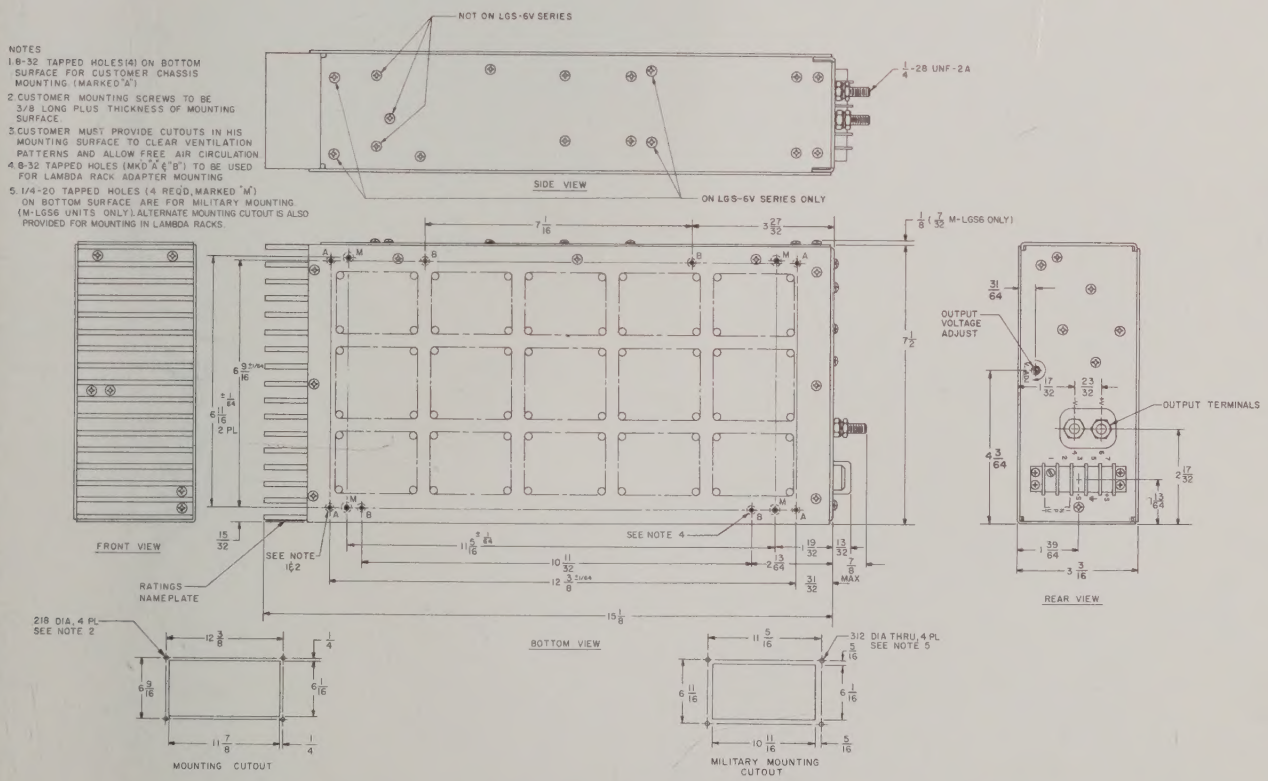
HC1	Protector, overvoltage	FHE-OV-011
L1	Choke, filter	BBA-LGS-6-20M
R19	Res., var., ww, 10,000 ohms ±10%, ½ w	DRT-10-055
T1	Transformer	ABA-LGS-6-20M

UNIQUE PARTS (Cont.)
MODEL MLGS-6-24-OV

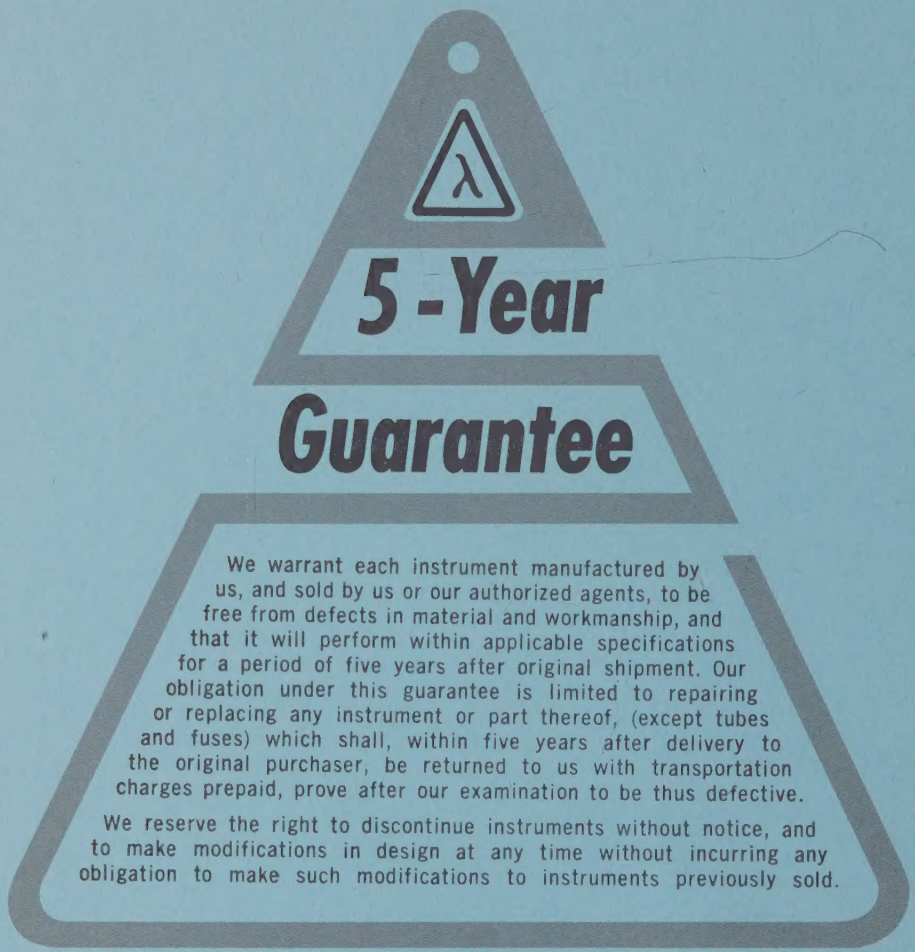
CIRC. DESC.	DESCRIPTION	LAMBDA NO.
HC1	Protector, overvoltage	FHE-OV-011
L1	Choke, filter	BBA-LGS-6-24M
R19	Res., var., ww, 10,000 ohms ±10%, ½ w	DRT-10-055
T1	Transformer	ABA-LGS-6-24M

MODEL MLGS-6-28-OV

HC1	Protector, overvoltage	FHE-OV-011
L1	Choke, filter	BBA-LGS-6-24M
R19	Res., var., ww, 10,000 ohms ±10%, ½ w	DRT-10-055
T1	Transformer	ABA-LGS-6-28M


NOTES
1. 8-32 TAPPED HOLES (4) ON BOTTOM SURFACE FOR CUSTOMER CHASSIS MOUNTING. (MARKED "A")
2. CUSTOMER MOUNTING SCREWS TO BE 3/8 LONG PLUS THICKNESS OF MOUNTING SURFACE.
3. CUSTOMER MUST PROVIDE CUTOUTS IN HIS MOUNTING SURFACE TO CLEAR VENTILATION PATTERNS AND ALLOW FREE AIR CIRCULATION.
4. 8-32 TAPPED HOLES (MKD "A" & "B") TO BE USED FOR LAMBDA RACK ADAPTER MOUNTING.
5. 1/4-20 TAPPED HOLES (4 REQD, MARKED "M") ON BOTTOM SURFACE ARE FOR MILITARY MOUNTING. (M-LGS6 UNITS ONLY). ALTERNATE MOUNTING CUTOUT IS ALSO PROVIDED FOR MOUNTING IN LAMBDA RACKS.
NOT ON LGS-6V SERIES
1/4-28 UNF-2A
SIDE VIEW
ON LGS-6V SERIES ONLY
1/8 (7/32 M-LGS6 ONLY)
OUTPUT VOLTAGE ADJUST
OUTPUT TERMINALS
FRONT VIEW
SEE NOTE 2
RATINGS NAMEPLATE
SEE NOTE 4
BOTTOM VIEW
REAR VIEW
.218 DIA, 4 PL SEE NOTE 2
MOUNTING CUTOUT
.312 DIA THRU, 4 PL SEE NOTE 5
MILITARY MOUNTING CUTOUT

Outline Drawing


5 - Year
Guarantee
We warrant each instrument manufactured by us, and sold by us or our authorized agents, to be free from defects in material and workmanship, and that it will perform within applicable specifications for a period of five years after original shipment. Our obligation under this guarantee is limited to repairing or replacing any instrument or part thereof, (except tubes and fuses) which shall, within five years after delivery to the original purchaser, be returned to us with transportation charges prepaid, prove after our examination to be thus defective.
We reserve the right to discontinue instruments without notice, and to make modifications in design at any time without incurring any obligation to make such modifications to instruments previously sold.

LAMBDA ELECTRONICS
515 BROAD HOLLOW ROAD • MELVILLE, L. I., NEW YORK • 516 MYRTLE 4-4200

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MP MASTER
MA28620